

BRU6144P0040US

10/031830

INTERNATIONAL APPLICATION NO.  
PCT/EP00/06944INTERNATIONAL FILING DATE  
20 July 2000PRIORITY DATE CLAIMED  
22 July 1999

## TITLE OF INVENTION

## FUSE COMBINATION UNIT AND OPERATING ROCKER WITH MONITORING DISPLAY

## APPLICANT(S) FOR DO/EO/US

Klaus Bruchmann

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1.  This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2.  This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3.  This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.
4.  The US has been elected by the expiration of 19 months from the priority date (Article 31).
5.  A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
  - a.  is attached hereto (required only if not communicated by the International Bureau).
  - b.  has been communicated by the International Bureau.
  - c.  is not required, as the application was filed in the United States Receiving Office (RO/US).
6.  An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a.  is attached hereto.
  - b.  has been previously submitted under 35 U.S.C. 154(d)(4).
7.  Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
  - a.  are attached hereto (required only if not communicated by the International Bureau).
  - b.  have been communicated by the International Bureau.
  - c.  have not been made; however, the time limit for making such amendments has NOT expired.
  - d.  have not been made and will not be made.
8.  An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9.  An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)). - **unexecuted**
10.  An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11.  A copy of the International Preliminary Examination Report (PCT/IPEA/409). (in German)
12.  A copy of the International Search Report (PCT/ISA/210). (in English and German)

## Items 13 to 20 below concern document(s) or information included:

13.  An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14.  An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15.  A **FIRST** preliminary amendment.
16.  A **SECOND** or **SUBSEQUENT** preliminary amendment.
17.  A substitute specification.
18.  A change of power of attorney and/or address letter.
19.  A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
20.  A second copy of the published international application under 35 U.S.C. 154(d)(4).
21.  A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22.  Certificate of Mailing by Express Mail
23.  Other items or information:
  - (a) WO 01/08190 (PCT/EP00/06944)
  - (b) Return Postcard

U.S. APPLICATION NO. (IF KNOWN) 10705185	7 CFR 2 INTERNATIONAL APPLICATION NO. PCT/EP00/06944	ATTORNEY'S DOCKET NUMBER BRU6144P0040US
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24. The following fees are submitted:

**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :**

<input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO .....	\$1040.00
<input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO .....	\$890.00
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO .....	\$740.00
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) .....	\$710.00
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) .....	\$100.00

**CALCULATIONS PTO USE ONLY**

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

**\$890.00**

Surcharge of **\$130.00** for furnishing the oath or declaration later than  20  30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

**\$0.00**

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	13 - 20 =	0	x \$18.00	<b>\$0.00</b>
Independent claims	2 - 3 =	0	x \$84.00	<b>\$0.00</b>
Multiple Dependent Claims (check if applicable).			<input type="checkbox"/>	<b>\$0.00</b>
<b>TOTAL OF ABOVE CALCULATIONS =</b>				<b>\$890.00</b>
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27). The fees indicated above are reduced by 1/2.				<b>\$445.00</b>
				<b>SUBTOTAL =</b> <b>\$445.00</b>
Processing fee of <b>\$130.00</b> for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).			+ \$0.00	
				<b>TOTAL NATIONAL FEE =</b> <b>\$445.00</b>
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).			<input type="checkbox"/> \$0.00	
<b>TOTAL FEES ENCLOSED =</b>				<b>\$445.00</b>
			<b>Amount to be:</b>	<b>\$</b>
			<b>refunded</b>	
			<b>charged</b>	<b>\$</b>

- A check in the amount of **\$445.00** to cover the above fees is enclosed.
- Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \_\_\_\_\_ to cover the above fees. A duplicate copy of this sheet is enclosed.
- The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **04-1644** A duplicate copy of this sheet is enclosed.
- Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

SEND ALL CORRESPONDENCE TO:

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Chicago, IL 60601

  
SIGNATURE

Paul M. Odell

NAME

28,332

REGISTRATION NUMBER

January 22, 2002

DATE

Recd PCT/PTO 08 MAY 2002

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#6/2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Klaus Bruchmann ) PATENT APPLICATION  
Serial No.: 10/031,830 ) Attorney Docket: BRU6144P0040US  
International )  
Filing Date: July 20, 2000 ) Group Art Unit:  
For: FUSE COMBINATION UNIT ) Not Yet Designated  
AND OPERATING ROCKER )  
WITH MONITORING DISPLAY ) Confirmation No. 5770  
(As Amended By The Enclosed )  
Preliminary Amendment )  
Examiner: Not Yet Designated )

PRELIMINARY AMENDMENT

Box PCT  
Commissioner For Patents  
Washington, D.C. 20231

Sir:

Please enter this Preliminary Amendment before examining the application and calculating the filing fee.

The Preliminary Amendment refers to the English language translation enclosed herewith.

IN THE SPECIFICATION:

On page 1, in lines 1 and 2, please delete the title, and insert the following new title, new paragraph, and new heading:

**--FUSE COMBINATION UNIT AND  
OPERATING ROCKER WITH MONITORING DISPLAY**

This application is an application filed under 35 U.S.C. Sec. 371 as a national stage of international application PCT/EP00/06944, which was filed July 20, 2000.

**TECHNICAL FIELD--**

On page 1, please amend the paragraph beginning at line 4 as follows:

--The invention relates to a switching rocker for a fused switch unit.--

On page 1, before line 9, please insert the following new heading:

**--BACKGROUND OF THE INVENTION--**

On page 2, in line 35, please insert the following new heading:

**--SUMMARY OF THE INVENTION--**

On page 3, please amend the paragraph beginning at line 6 as follows:

--The object is achieved by a switching rocker for a fused switch unit as claimed herein, and by a fused switch unit as claimed herein.--

On page 6, after line 32, please insert the following new heading:

**--BRIEF DESCRIPTION OF THE DRAWINGS--**

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On page 7, after line 6, please insert the following new heading:

--DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT--.

On page 9, please amend the two consecutive paragraphs beginning at line 21 as follows:

--Both the operating grip 31 on the switching rocker 30 and the grip part 11 of the fuse plug 10 have through-openings 95 and 96, which are offset with respect to one another when the fuse plug 10 is in a limit position such that it is inserted into the switching rocker 30, and they are thus not aligned with one another. These through-openings 95, 96 are used for a locking apparatus (not shown) to be passed through.

In order to pass the locking apparatus through, the fuse plug 10 must be withdrawn from its limit position in the switching rocker 30, so that the through-openings 95 and 96 are at least partially aligned. A locking apparatus which is then pushed through the through-openings 95, 96 prevents the fuse plug 10 from being pushed back to its limit position. However, if the fuse plug 10 is not in its limit position, the switching rocker 30 cannot be pivoted to its switched-on position, since parts of the fuse plug 10 abut against parts of the housing 2, and prevent the switching rocker 30 from being switched to the switched-on position. The switching rocker 30 is thus reliably held in its switched-off position, which is of particular importance when it is necessary to carry out repairs on machines or electrical appliances which are supplied via the fused switch unit 1. This thus reliably prevents

accidental switching on, or switching on caused, for example, by vibration, and hence prevents any hazard to the operator.

On page 12, in line 1, please delete the heading "Patent Claims" and insert the following new heading: --WHAT IS CLAIMED IS:--.

**IN THE CLAIMS:**

Please amend claim 3 as follows:

3. (Amended) The switching rocker as claimed in claim 1, wherein the optical indication (35) is arranged behind a transparent window (33).

Please amend claim 4 as follows:

4. (Amended) The switching rocker as claimed in claim 1, wherein the switching rocker (30) is at least partially composed of transparent material, with the optical indication (35) being arranged behind the transparent material.

Please amend claim 5 as follows:

5. (Amended) The switching rocker as claimed in claim 1, wherein the indication (35) is arranged in the vicinity of an operating grip (31) on the switching rocker (30).

Please amend claim 6 as follows:

6. (Amended) The switching rocker as claimed in claim 1, wherein the indication (35) is arranged on one side which faces the switched-off position of the switching rocker (30) of a grip part (31) thereof, such that it is covered by parts of the housing (2) when the switching rocker (30) is in the switched-off position, and can be seen when the switching rocker (30) is in the switched-on position.

Please amend claim 7 as follows:

7. (Amended) The switching rocker as claimed in claim 1, wherein the switching rocker (30) has apparatuses (50, 51 52) for a monitoring circuit.

Please amend claim 9 as follows:

9. (Amended) The switching rocker as claimed in claim 7, wherein the apparatuses (50, 51, 52) for the monitoring circuit are arranged in an inner area (32) of the switching rocker (30).

Please amend claim 10 as follows:

10. (Amended) The switching rocker as claimed in claim 9, wherein the inner area (32) is essentially intrinsically closed, with the exception of contact openings (56, 57) for the contact elements (50, 52).

Please amend claim 13 as follows:

13. (Amended) The fused switch unit as claimed in claim 11, wherein the housing (2) further has at least one contact apparatus (53), which makes contact with at least one contact element (52), which is arranged in the switching rocker (30) or in the fuse plug (10), when the switching rocker (30) is in a switched-on position, so that the monitoring circuit is closed, and does not make contact with the at least one contact element (52) when the switching rocker (30) is in a switched-off position, so that the monitoring circuit is interrupted.

**REMARKS**

The amendments to the application have been made to remove multiple dependencies from some of the claims, to make claim 10 more clear, to set forth headings in the specification, to make the terminology on page 9 more clear at three places by changing “interlocking” to --locking--, and to conform with U.S. practice. The “translated” English language title has been amended to the English language title as set forth by WIPO in the PCT Publication WO 01/08190 A1 so as to minimize confusion.

Applicant believes that these amendments are fully supported by the international application and do not believe that these amendments constitute new matter.

Applicant herewith submits a copy of the English translation of the original international application along with this Preliminary Amendment.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached marked-up version is captioned “VERSION WITH MARKINGS TO SHOW CHANGES MADE.”

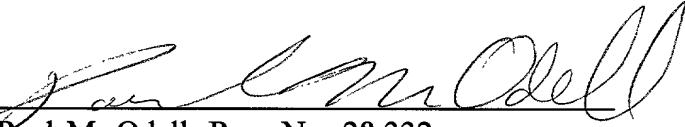
Serial No. 10/031,830 - - - - 8

Entry of the amendments is respectfully requested.

Respectfully submitted,

WOOD, PHILLIPS, KATZ, CLARK & MORTIMER

By

  
Paul M. Odell, Reg. No. 28,332

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May 8, 2002

U.S. PATENT AND TRADEMARK OFFICE

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE SPECIFICATION**

On page 1, in lines 1 and 2, the title has been canceled and replaced with the following new title, new paragraph, and new heading as follows:

FUSE COMBINATION UNIT AND  
OPERATING ROCKET WITH MONITORING DISPLAY

This application is an application filed under 35 U.S.C. Sec. 371 as a national stage of international application PCT/EP00/06944, which was filed July 20, 2000.

TECHNICAL FIELD.

On page 1, the paragraph beginning at line 4 has been amended as follows:

The invention relates to a switching rocker for a fused switch unit [as claimed in the preamble of claim 1, and to a fused switch unit as claimed in the preamble of claim 11].

On page 1, before line 9, the following new heading has been added:

BACKGROUND OF THE INVENTION.

On page 2, in line 35, the following new heading has been added:

SUMMARY OF THE INVENTION.

On page 3, the paragraph beginning at line 6 has been amended as follows:

The object is achieved by a switching rocker for a fused switch unit as claimed [in claim 1] herein, and by a fused switch unit as claimed herein. [in claim 11. Claims 2 to 9 characterize advantageous embodiments of the switching rocker according to the invention, and claims 12 and 13 characterize advantageous embodiments of the fused switch unit according to the invention.]

On page 6, after line 32, the following new heading has been added:

#### BRIEF DESCRIPTION OF THE DRAWINGS.

On page 7, after line 6, the following new heading has been added:

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT.

On page 9, the two consecutive paragraphs beginning at line 21 have been amended as follows:

Both the operating grip 31 on the switching rocker 30 and the grip part 11 of the fuse plug 10 have through-openings 95 and 96, which are offset with respect to one another when the fuse plug 10 is in a limit position such that it is inserted into the switching rocker 30, and they are thus not aligned with one another. These through-openings 95, 96 are used for a[n inter]locking apparatus (not shown) to be passed through.

In order to pass the [inter]locking apparatus through, the fuse plug 10 must be withdrawn from its limit position in the switching rocker 30, so that the through-openings 95 and 96 are at least partially aligned. [An inter] A locking apparatus which is then pushed through the through-openings 95, 96 prevents the fuse plug 10 from being pushed back to its limit position. However, if the fuse plug 10 is not in its limit position, the switching rocker 30 cannot be pivoted to its switched-on position, since parts of the fuse plug 10 abut against parts of the housing 2, and prevent the switching rocker 30 from being switched to the switched-on position. The switching rocker 30 is thus reliably held in its switched-off position, which is of particular importance when it is necessary to carry out repairs on machines or electrical appliances which are supplied via the fused switch unit 1. This thus reliably prevents accidental switching on, or switching on caused, for example, by vibration, and hence prevents any hazard to the operator.

On page 12, in line 1, the heading has been changed as follows:

[Patent Claims] WHAT IS CLAIMED IS:

IN THE CLAIMS:

Claim 3 has been amended as follows:

3. (Amended) The switching rocker as claimed in claim 1 [or 2], wherein the optical indication (35) is arranged behind a transparent window (33).

Claim 4 has been amended as follows:

4. (Amended) The switching rocker as claimed in claim 1 [or 2], wherein the switching rocker (30) is at least partially composed of transparent material, with the optical indication (35) being arranged behind the transparent material.

Claim 5 has been amended as follows as follows:

5. (Amended) The switching rocker as claimed in claim 1 [one of the preceding claims], wherein the indication (35) is arranged in the vicinity of an operating grip (31) on the switching rocker (30).

Claim 6 has been amended as follows as follows:

6. (Amended) The switching rocker as claimed in claim 1 [one of the preceding claims], wherein the indication (35) is arranged on one side which faces the switched-off position of the switching rocker (30) of a grip part (31) thereof, such that it is covered by parts of the housing (2) when the switching rocker (30) is in the switched-off position, and can be seen when the switching rocker (30) is in the switched-on position.

Claim 7 has been amended as follows:

7. (Amended) The switching rocker as claimed in claim 1 [one of the preceding claims], wherein the switching rocker (30) has apparatuses (50, 51 52) for a monitoring circuit.

Claim 9 has been amended as follows:

9. (Amended) The switching rocker as claimed in claim 7 [one of claims 7 or 8], wherein the apparatuses (50, 51, 52) for the monitoring circuit are arranged in an inner area (32) of the switching rocker (30).

Claim 10 has been amended as follows:

10. (Amended) The switching rocker as claimed in claim 9, wherein the inner area (32) is essentially intrinsically closed, with the exception of [and has only] contact openings (56, 57) for the contact elements (50, 52).

Claim 13 has been amended as follows:

13. (Amended) The fused switch unit as claimed in claim 11 [or 12], wherein the housing (2) further has at least one contact apparatus (53), which makes contact with at least one contact element (52), which is arranged in the switching rocker (30) or in the fuse plug (10), when the switching rocker (30) is in a switched-on position, so that the monitoring circuit is closed, and does not make contact with the at least one contact element (52) when the switching rocker (30) is in a switched-off position, so that the monitoring circuit is interrupted.

Fused switch unit and switching rocker with a  
monitoring indication

5 The invention relates to a switching rocker for a fused switch unit as claimed in the preamble of claim 1, and to a fused switch unit as claimed in the preamble of claim 11.

10 Fused switch units such as these, as well as switching rockers used in them, in whose fuse plugs fuse links can be inserted, are used in a wide range of embodiments in both private and commercial buildings, in particular in buildings in which machines are electrically operated. It is also possible to use such 15 fused switch units and components such as the switching rocker directly on or in machine elements or housings, for electrical protection of electrically operated machines.

20 A fused switch unit having a switching rocker of this generic type is known, for example, from DE 34 06 815 C2. Fused switch units such as these are used to interrupt the circuit of, and hence the electrical supply to, machines and appliances automatically when 25 the current intensity or the power in the circuit exceeds a specific, fixed value. In order to match these values to the circumstances, in particular to the electrical machines and appliances as well as external requirements, for example safety requirements, fuse 30 links which have different characteristic values can be inserted into the fused switch units, or into the fuse plug.

35 The purpose of these fused switch units is to reliably manually interrupt the circuit, in particular when it is necessary to carry out repairs to the electrical appliances and machines. To do this, the switching rocker which contains the fuse plug together with the

corresponding fuse link, and which is mounted in a housing of the fused switch unit such that it can pivot between a switched-on position and a switched-off position, is moved to its switched-off position.

5

Since the fuse links which are used in a fused switch unit are generally fuses of the type that blow by melting, which may be blown defectively or by an excessively high load, it is advantageous to monitor 10 the serviceability of the fuse link by means of a monitoring apparatus. The monitoring of the serviceability of the fuse link should be understood as meaning both the monitoring of any defects which may be present in the fuse link itself and monitoring for any 15 defect in the contact with the fuse link in a main circuit of the fused switch unit.

A monitoring circuit for this purpose is known, which bridges the input and the output of the fused switch 20 unit, in parallel with the main circuit passing through the fuse link, via a very high-impedance connection. A lamp is normally integrated as the monitoring indication in the monitoring circuit.

25 A significant current flows through the very high-impedance monitoring circuit only when the low-impedance connection in the main circuit is interrupted, for example by the blowing of the fuse link. Other monitoring systems are also possible, but 30 these are all based on an interruption in the main circuit causing visible changes to occur in the monitoring circuit, which are indicated by means of a monitoring indication. One problem in this context is the position of the monitoring indication.

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Accordingly, one object of the invention is to provide a low-cost fused switch unit having a long-life monitoring indication, which is arranged such that a simple structural design, in particular a compact

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design of the fused switch unit, is possible, with the monitoring indication being intended to supply the operator with information which cannot be misunderstood.

5

The object is achieved by a switching rocker for a fused switch unit as claimed in claim 1, and by a fused switch unit as claimed in claim 11. Claims 2 to 9 characterize advantageous embodiments of the switching rocker according to the invention, and claims 12 and 13 characterize advantageous embodiments of the fused switch unit according to the invention.

According to the invention, the arrangement of the indication in the switching rocker results in the indication being integrated very well in the structural design of the fused switch unit, without requiring any additional space. The indication can be integrated in the switching rocker, so that it is protected from the outside and damage is avoided.

Furthermore, the switching rocker is a part which is subject to considerably less wear than the fuse plug. The life to be expected for the monitoring indication is thus noticeably increased in comparison to accommodation in the fuse plug.

Furthermore, it is feasible to design the fuse link and the fuse plug as a unit, so that different fuse plugs must be made available and interchanged, depending on the application. Since the monitoring indication is arranged in the switching rocker and not in a part subject to wear or in a part which can be lost or needs to be replaced regularly, this reduces the overall costs of the fused switch unit.

In comparison to positioning of the monitoring indication in the housing of the fused switch unit, positioning in the switching rocker has, in particular,

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the advantage that the fused switch unit can be designed to be more compact. Installation in the housing would necessitate an increase in the height of the housing above the area of the switching rocker, in 5 order to accommodate the monitoring indication in the housing. If the monitoring indication were arranged at the side in the housing, this would mean that the fused switch unit would have greater dimensions in this direction and, furthermore, that disadvantages would 10 have to be accepted with regard to installation of the fused switch unit, since further areas of the fused switch unit need to be visible, that is to say they must not be covered by other elements. An installation of the fused switch unit in which only the minimal area 15 around the operating grip of the switching rocker is visible is highly desirable, on the other hand, in particular for visual reasons, as well.

Furthermore, an arrangement of the monitoring indication in the housing means that it is visible not only when the switching rocker is in the switched-on position, but also when it is in the switched-off position. Since, for safety reasons, the monitoring circuit must be interrupted in the switched-off 25 position, the monitoring indication in principle does not illuminate in the switched-off position, to be precise irrespective of the serviceability of the fuse link. It is thus possible, in particular, for an untrained operator to be irritated by the unilluminated 30 monitoring indication in conjunction with an interrupted circuit in the switched-off position, possibly unnecessarily replacing serviceable parts, in particular a serviceable fuse link. Such an irritation to the operator is avoided by the arrangement according 35 to the invention, when the monitoring indication is not externally visible in the switched-off position.

In one preferred embodiment, the monitoring indication is arranged in an inner area of the switching rocker.

The monitoring indication is thus protected, so that no damage can occur, irrespective of whether this is due to external action by the operator or by contact with other parts of the fused switch unit.

5

The indication is in this case preferably arranged behind a transparent window, or else the switching rocker is produced at least partially from transparent material, behind which the monitoring indication can be 10 seen from the outside.

It should be stressed that the arrangement in the inner area of the switching rocker is not intended to adversely affect the capability to replace the 15 monitoring indication, and, in particular, the window mentioned above or area elements of the switching rocker, for example, can be opened in order, when necessary, to allow access to the monitoring indication. However, since the monitoring indications 20 generally have an extremely long life and the time for which they are switched on and which governs the life is short, such replacement processes are necessary only extremely rarely, and the capability to replace the monitoring indication can thus also be dispensed with, 25 in favor of simpler construction.

It is advantageous to arrange the monitoring indication in the vicinity of an operating grip, in particular on that side of the switching rocker which faces the 30 switched-off position. Thus, when the switching rocker is in the switched-on position, the monitoring indication is in a central, easily visible position, while it is automatically covered by parts of the housing as soon as the switching rocker is in its 35 switched-off position. There is thus no need for any additional covering apparatuses, which results in a simplified structural design both of the switching rocker and of the fused switch unit.

In one particularly preferred embodiment, the switching rocker furthermore has apparatuses for the monitoring circuit, in particular contact elements, and advantageously spring elements, which close the 5 monitoring circuit when the switching rocker is in the switched-on position, and interrupt it when the switching rocker is in the switched-off position. This results in an advantageous design, in which only simple contact elements need be provided in the housing of the 10 fused switch unit.

The apparatuses for the monitoring circuit are advantageously likewise arranged in the interior of the switching rocker, preferably in the area of the 15 monitoring indication. The interior is essentially closed, and has only contact openings, in order that contact can be made with the contact elements arranged in the housing.

20 The contact and/or connecting elements which make contact with the apparatuses for the monitoring circuit when the switching rocker is in the switched-on position are preferably elements of the main circuit. This means that there is no need to provide any 25 additional elements, thus reducing the costs and the susceptibility of the fused switch unit to defects.

However, it is also possible to provide at least one contact apparatus, preferably a spring apparatus, which 30 makes contact with at least one contact element in the monitoring circuit when the switching rocker assumes its switched-on position.

35 The invention will be described in more detail in the following text with reference to the schematic illustration of a fused switch unit and a switching rocker, in which:

Figure 1 shows a cross-sectional view of one

embodiment of a fused switch unit with a switching rocker in the switched-on position, and

Figure 2 shows the fused switch unit as shown in Figure 1, with the switching rocker in the switched-off position.

Figure 1 shows one embodiment of a fused switch unit 1 with a housing 2 and a switching rocker 30 in the switched-on position. A fuse plug 10, which holds a 5 fuse link 20, is inserted into the switching rocker 30.

When the switching rocker 30 is in the switched-on position, the fuse link 20 is connected by means of contact elements 70, 71, 72, 73 to an input and an 10 output, so that the main circuit is closed. The fuse link 20 is in this case pressed by a spring apparatus 98 against the direct contact elements 70, as well as 71 and 72.

15 The contact element 70, which is in the form of a spring, in this case essentially carries out three functions. Contact is made via the contact element 70 with the electronics arranged in the fused switch unit. Furthermore, the element 70, which is in the form of a 20 spring, holds the fuse link 20 in the desired position relative to the fuse plug 10 and, furthermore, fixes the position of the fuse plug 10 in the switching rocker 30.

25 The monitoring circuit likewise uses the contact elements 70, 71 of the main circuit on one side, and closes the monitoring circuit via further contact elements 50, 52, 53 and a high-value resistor 51. The contact elements 50 and 52 as well as the resistor 51 30 are arranged in the interior 32 of the switching rocker 30.

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The contact elements 50, 52 and 53 are likewise spring elements, thus ensuring reliable contact.

Furthermore, an optical monitoring indication, a lamp 35 which is indicated only schematically here, is arranged in the interior 32 of the switching rocker 30. As soon as the main circuit is interrupted, in particular by the fuse link 20 blowing, a sufficient current flows through the monitoring circuit to illuminate the monitoring indication 35. This indicates that there is a defect in the main circuit.

The monitoring indication 35 is positioned behind a transparent window 33, so that the operator can see the monitoring light in the switching rocker 30, which is otherwise composed of material that is not transparent.

The interior 32 of the switching rocker 30 in which, as described above, both the lamp 35 and a number of apparatuses for the monitoring circuit are arranged, is essentially completely closed, thus preventing damage to the apparatuses. The interior 32 has only two contact openings 56 and 57, in order to allow contact between the contact apparatuses 52 and 53, as well as 50 and 70. The contact between the elements 50 and 70 is always closed as soon as a fuse plug 10 with a fuse link 20 is inserted into the switching rocker 30. The contact between the contact elements 52 and 53 exists only when the switching rocker 30 assumes its switched-on position.

Figure 2 shows the switching rocker 30 in its switched-off position. It can be seen that both the main circuit and the monitoring circuit are each interrupted twice, namely firstly between the contact elements 70 and 71 and between the contact element 72 and the fuse link 20, and secondly at the jointly used contact elements 70 and 71, as well as at the contact elements 52 and 53.

The sprung contact element 53 engages in a recess 80 in the outer wall of the inner area 32 of the switching rocker 30, and is thus positioned reliably.

- 5 The connection between the contact elements 50 and 70 still exists, since the fuse plug 10, together with the fuse link 20, is still in the operating position in the switching rocker 30.
- 10 As can likewise be seen from Figure 2, the monitoring indication 35 is covered on the outside both by the operating grip 31 of the switching rocker 30 and by the housing 2, so that the monitoring indication 35 cannot be seen by the observer. The monitoring indication 35 can be seen only when the switching rocker 30 is in the switched-on position, since it is then in a central position within an opening 90 in the housing 2, through which the operating grip of the switching rocker 30 projects.
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- 20 Both the operating grip 31 on the switching rocker 30 and the grip part 11 of the fuse plug 10 have through-openings 95 and 96, which are offset with respect to one another when the fuse plug 10 is in a limit position such that it is inserted into the switching rocker 30, and they are thus not aligned with one another. These through-openings 95, 96 are used for an interlocking apparatus (not shown) to be passed through.
- 25
- 30 In order to pass the interlocking apparatus through, the fuse plug 10 must be withdrawn from its limit position in the switching rocker 30, so that the through-openings 95 and 96 are at least partially aligned. An interlocking apparatus which is then pushed through the through-openings 95, 96 prevents the fuse plug 10 from being pushed back to its limit position. However, if the fuse plug 10 is not in its limit position, the switching rocker 30 cannot be pivoted to
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its switched-on position, since parts of the fuse plug 10 abut against parts of the housing 2, and prevent the switching rocker 30 from being switched to the switched-on position. The switching rocker 30 is thus 5 reliably held in its switched-off position, which is of particular importance when it is necessary to carry out repairs on machines or electrical appliances which are supplied via the fused switch unit 1. This thus reliably prevents accidental switching on, or switching 10 on caused, for example, by vibration, and hence prevents any hazard to the operator.

List of reference symbols

1	Fused switch unit
2	Housing
10	Fuse plug
11	Grip part (fuse plug)
20	Fuse link
30	Switching rocker
31	Operating grip (switching rocker)
32	Inner area (switching rocker)
33	Window
35	Monitoring indication
50	Contact element
51	Resistor
52	Contact element
53	Contact apparatus (housing)
56, 57	Contact opening
70, 71, 72, 73	Contact elements
90	Opening (housing)
95, 96	Through-openings (fuse plug and operating grip)
98	Spring apparatus

Patent Claims

1. A switching rocker (30) for a fused switch unit (1), into which a fuse plug (10) for holding a fuse link (20) can be inserted and which is mounted in a housing (2) of a fused switch unit (1) such that it can pivot to and fro between a switched-off position and a switched-on position, wherein the switching rocker (30) has an indication (35) for monitoring the serviceability of the fuse link (20).

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2. The switching rocker as claimed in claim 1, wherein the indication (35) is arranged in an inner area (32) of the switching rocker (30).

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3. The switching rocker as claimed in claim 1 or 2, wherein the optical indication (35) is arranged behind a transparent window (33).

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4. The switching rocker as claimed in claim 1 or 2, wherein the switching rocker (30) is at least partially composed of transparent material, with the optical indication (35) being arranged behind the transparent material.

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5. The switching rocker as claimed in one of the preceding claims, wherein the indication (35) is arranged in the vicinity of an operating grip (31) on the switching rocker (30).

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6. The switching rocker as claimed in one of the preceding claims, wherein the indication (35) is arranged on one side which faces the switched-off position of the switching rocker (30) of a grip part (31) thereof, such that it is covered by parts of the housing (2) when the switching rocker (30) is in the switched-off position, and can be

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seen when the switching rocker (30) is in the switched-on position.

7. The switching rocker as claimed in one of the preceding claims, wherein the switching rocker (30) has apparatuses (50, 51 52) for a monitoring circuit.
8. The switching rocker as claimed in claim 7, wherein the apparatus (50, 51, 52) for a monitoring circuit has contact elements (50, 52) which close the monitoring circuit when the switching rocker (30) is in the switched-on position, and interrupt it when the switching rocker (30) is in the switched-off position.
9. The switching rocker as claimed in one of claims 7 or 8, wherein the apparatuses (50, 51, 52) for the monitoring circuit are arranged in an inner area (32) of the switching rocker (30).
10. The switching rocker as claimed in claim 9, wherein the inner area (32) is essentially closed, and has only contact openings (56, 57) for the contact elements (50, 52).
11. A fused switch unit (1) with a housing (2), a switching rocker (30), in particular as claimed in one of claims 1 to 10, which is mounted in the housing (2) of the fused switch unit (1) such that it can pivot to and fro between a switched-on position and a switched-off position, and apparatuses (50, 51, 52, 53) for a monitoring circuit as well as an indication (35) for monitoring the serviceability of the fuse link (10), wherein the indication (35) is arranged in the switching rocker (30), with the indication (35) being an optical indication.

12. The fused switch unit as claimed in claim 11,  
wherein contact and/or connecting elements (70,  
71) of the housing (2), of the switching rocker  
(30) and/or of the fuse plug (10) form both  
5 elements of a main circuit and elements of the  
monitoring circuit.

13. The fused switch unit as claimed in claim 11 or  
12, wherein the housing (2) further has at least  
10 one contact apparatus (53), which makes contact  
with at least one contact element (52), which is  
arranged in the switching rocker (30) or in the  
fuse plug (10), when the switching rocker (30) is  
in a switched-on position, so that the monitoring  
15 circuit is closed, and does not make contact with  
the at least one contact element (52) when the  
switching rocker (30) is in a switched-off  
position, so that the monitoring circuit is  
interrupted.

ABSTRACT

The invention relates to a fused switch unit (1) with a housing (2) and a switching rocker (30), which is mounted in the housing (2) of the fused switch unit (1) such that it can pivot to and fro between a switched-on position and a switched-off position. The fused switch unit (1) has apparatuses (70, 71, 72, 73) for a monitoring circuit and an indication (35) for monitoring the serviceability of a fuse link (20), with the indication (35) being arranged in the switching rocker (30). The indication (35) is preferably an optical indication.

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First Named Inventor	Klaus Bruchmann
AttUnit Confirmation #	5770
Examiner Name	Not Yet Designated
Attorney Docket Number	BRU6144P0040US

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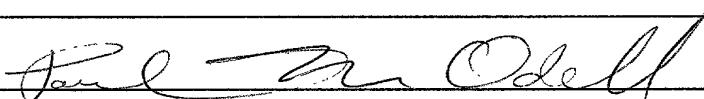
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Signature



Date

May 8, 2002

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DESIGN PATENT APPLICATION  
(37 CFR 1.63)**

Attorney Docket No.:	BRU6144P0040US
First Named Inventor:	Klaus Bruchmann
<i>COMPLETE IF KNOWN</i>	
Application Number:	
Filing Date:	
Group Art Unit:	
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As a below-named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first, and sole inventor (if only one name is listed) or an original, first and joint inventor (if plural names are listed) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **FUSE COMBINATION UNIT AND OPERATING ROCKER WITH MONITORING DISPLAY**, the specification of which:

is attached hereto; or

was filed on July 20, 2000 as PCT International Application Serial No. PCT/EP00/06944 and was amended on \_\_\_\_\_  
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I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information which is material to patentability as defined in 37 CFR. 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

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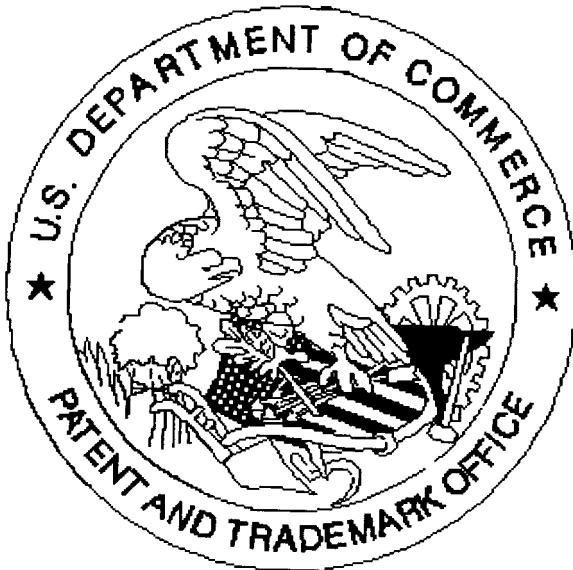
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